

FOR NATIONAL PHASE SUBMISSION

CLAIM AMENDMENTS

WHAT IS CLAIMED IS:

This listing of the claims will replace all prior versions, and listing, of claims in the application:

1. (Currently Amended) ~~Method~~ A method for polarizing a piezoelectric first actuator ~~(1)~~, ~~especially for use in an injection valve, comprising the steps of:~~

~~with the~~

~~- providing the~~ first actuator ~~(1)~~ consisting of a number of piezoelectric layers ~~(11)~~ which are arranged between two end surfaces ~~(16, 17)~~, ~~with wherein~~ each layer ~~(11)~~ being arranged between two electrodes ~~(12)~~, ~~with~~

~~- applying~~ changing voltage values for polarizing the layers ~~(11)~~ ~~being applied~~ to the electrodes ~~(12)~~ of the layers ~~(11)~~, ~~with wherein~~ the first actuator ~~(1)~~ being arranged during polarization between two retaining elements ~~(5, 6)~~, ~~characterized in that~~

~~- providing~~ a second actuator ~~(2)~~ ~~is arranged~~ in series with the first actuator ~~(1)~~, ~~that wherein~~ the second actuator ~~(2)~~ ~~features comprises~~ two end surfaces ~~(16, 17)~~, ~~with wherein~~ an end surface ~~(16)~~ of the first actuator having an effective connection to an end surface ~~(17)~~ of the second actuator ~~(2)~~, ~~that~~

~~- applying~~ a compressive stress ~~is applied~~ to the ~~two~~ ~~first and second~~ actuators ~~(1, 2)~~ via the outer end surfaces ~~(17, 16)~~ through the retaining elements ~~(5, 6)~~, ~~that -~~ ~~supplying~~ the first and the second actuator ~~(1, 2)~~ ~~are~~

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~~supplied~~ for polarization with a first or with a second changing voltage, ~~that~~

~~- defining, after a start phase, the voltages which are applied to the two actuators-(1, 2) are defined~~ in a manner whereby the sum of the two voltages is approximately constant over time, so that the total length of the two actuators-(1, 2), despite the changes in length of the first and the second actuator-(1, 2) generated by the voltages are kept approximately constant over time.

2. (Currently Amended) ~~A method in accordance with according to~~ claim 1, ~~characterized in that wherein~~ the first and the second voltage switches during the polarization between minimum values and maximum values.

3. (Currently Amended) A method according to claim 1,
~~wherein~~~~Method in accordance with one of the claims 1 or 2,~~
~~characterized in that,~~ during the start phase, the maximum value of the changing first and second voltage is increased from an initial value to an end value, and ~~that~~ after the start phase during the polarization of the first and/or of the second actuator-(1, 2) the amplitude of the first and/or the second voltage changes cyclically between the end value and a lower value.

4. (Currently Amended) A method according to claim 1,
~~wherein~~~~Method in accordance with claim 1, characterized in~~
~~that~~ a not yet polarized actuator is used as the second actuator-(2) and thereby two actuators-(1, 2) are polarized simultaneously in one polarization process.

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5. (Currently Amended) A method according to claim 1,
~~wherein Method in accordance with one of the claims 1 to 4,~~
~~characterized in that~~ the first and the second voltage have
the same frequency, ~~that and~~ the first and the second voltage
are applied with phase offset to the first and the second
actuator ~~(1, 2)~~ in such a way that after the start phase the
sum of the first and the second voltage essentially remains
constant.

6. (Currently Amended) A method according to claim 1,
~~wherein Method in accordance with one of the claims 1 to 5,~~
~~characterized in that~~ voltage pulses are used in a defined
polarization direction, ~~that~~ the first and the second actuator
~~(1, 2)~~ are supplied with a voltage pulse, and ~~that wherein~~ the
electrodes of the second or the first actuator ~~(1, 2)~~ are
simultaneously set to a uniform potential.

7. (Currently Amended) A method according to claim 1,
~~wherein Method in accordance with one of the claims 1 to 6,~~
~~characterized in that~~ the voltage pulses are formed in the
manner such that the change over time of the voltage at the
electrodes of the first actuator ~~(1)~~ is the same as the change
over time of the voltage at the electrodes of the second
actuator ~~(2)~~, ~~with wherein~~ the voltage rising at one actuator
~~(1)~~ and simultaneously falling at the other actuator ~~(2)~~.

8. (Currently Amended) A method according to claim 3,
~~wherein Method in accordance with one of the claims 3 to 7,~~
~~characterized in that~~ a retaining element ~~(6)~~ is supported to

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allow movement in relation to the other retaining element-(5), ~~that and~~ a change in length occurring during the start phase of the polarization process is compensated for by the first and/or of the second actuator-(1, 2) by a shifting of the movable retaining element-(6).

9. (Currently Amended) ~~Device~~ A device for polarizing a piezoelectric first actuator-(1), ~~with wherein~~ the piezoelectric first actuator-(1) being tensioned between two retaining elements-(5, 6) of a pretensioning holder-(7), ~~with~~ the piezoelectric first actuator-(1) being connected via control lines-(10) with a control unit-(9) with a pretensioning force being able to be applied to the first actuator-(1) via the retaining elements-(5, 6), ~~characterized in that~~ a second piezoelectric actuator-(2) is arranged between the first actuator-(1) and a retaining element-(5, 6) which is connected via second control lines-(21) to the control unit-(9), ~~that and~~ the control unit-(9) after the start phase during ~~the a~~ polarization process supplies the first and the second actuator-(1, 2) with polarization voltages with changing amplitudes in such a way that the length changes of the two actuators-(1, 2) generated through the polarization voltages essentially balance out.

10. (Currently Amended) ~~Device~~ A device ~~in accordance with~~ according to claim 9, ~~characterized in that wherein~~ a pressure sensor-(19) is provided which records the pretensioning force-(F) and forwards it via signal lines-(20) to the control unit-(9), ~~that and~~ the control unit-(9) defines the polarization voltages of the two actuators-(1, 2) such

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that the measured pretension force ~~(F)~~ which acts on the two actuators ~~(1, 2)~~ lies within a specified range of values during the polarization.

11. (Currently Amended) A device according to claim 9, wherein Device in accordance with claim 9, characterized in that the two retaining elements ~~(5, 6)~~ are mounted on a housing ~~(7)~~, ~~that~~ one retaining element ~~(6)~~ is mounted via a motors system ~~(8)~~ movably on the housing ~~(7)~~, ~~that~~ the motor system ~~(8)~~ is connected via control leads to the control unit ~~(9)~~ and ~~that wherein~~ the control unit ~~(9)~~ changes the position of the moveable retaining element ~~(6)~~ during the start phase, in order to compensate for the changes in length arising from the increases in amplitude of the first and the second voltage or of the first and/or of the second actuator ~~(1, 2)~~.

12. (NEW) A device comprising:

a piezoelectric first actuator tensioned between two retaining elements of a pretensioning holder and connected via control lines with a control unit with a pretensioning force being able to be applied to the first actuator via the retaining elements,

a second piezoelectric actuator arranged between the first actuator and a retaining element which is connected via second control lines to the control unit, wherein the control unit after a start phase is operable during a polarization process to supply the first and the second actuator with polarization voltages with changing amplitudes in such a way that the length changes of the two actuators generated through the polarization voltages essentially balance out.

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13. (NEW) A device according to claim 12, further comprising a pressure sensor which records the pretensioning force and forwards it via signal lines to the control unit, wherein the control unit defines the polarization voltages of the two actuators such that the measured pretension force which acts on the two actuators lies within a specified range of values during the polarization.

14. (NEW) A device according to claim 12, wherein the two retaining elements are mounted on a housing, one retaining element is mounted via a motors system movably on the housing, the motor system is connected via control leads to the control unit and wherein the control unit changes the position of the moveable retaining element during the start phase, in order to compensate for the changes in length arising from the increases in amplitude of the first and the second voltage or of the first and/or of the second actuator.